Amendments to the Drawings:

Fig. 1 has been amended to include "user agents" which are identified by reference numeral 10.

REMARKS

The present invention is a communication system for implementing personalizable and customizable features while avoiding feature interactions and a system for implementing features while avoiding feature interactions. A communication system for implementing personalizable and customizable features while avoiding feature interactions in accordance with an embodiment of the invention includes a tuple space (3); and a plurality of user agents (10) representing the features, the user agents communicating with each other via assertions posted to the tuple space in order to implement the features, each of the features being structured as a set of deontic task trees having a parent node with an obligated inherent action in a plurality of child nodes with respective node interactions performed according to a predetermined sequence for implementation of each feature, the results of which are reported back to the parent node, the parent node having deontic modalities on the behavior of the child nodes such that successful implementation of the features results from successful occurrence of the inherent action and composed success of the node actions of the children nodes. In the Substitute Specification, see page 11, lines 13-17, for an explanation of deontic logic; see page 14, lines 24 through page 15, lines 1-31; and page 16, lines 9-21, for an explanation of the configuration of nodes into a tree.

The specification has been amended to improve its form for reexamination including eliminating the existence of embedded hyperlinks, etc.

Fig. 1 has been amended to refer to User Agents 10. See page 14, lines 14, *et seq.*, of the Substitute Specification. The specification and drawings have been amended to utilize the reference numeral 10 to identify the user agent in Fig. 1.

Claim 7 has been amended to remove the noted erroneous recitation of "15".

Claims 1-10 and 12-29 stand rejected under 35 U.S.C. §112, second paragraph, for being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 1 has been amended and newly submitted claim 30 has been drafted to recite a system for implementing features while avoiding feature interactions and a "predetermined sequence for implementation of each feature" to overcome the stated grounds of rejection.

It is noted the Examiner refers to "said parent node replacing deontic modalities on the behavior of said child nodes such that successful implementation of said feature results from occurrence of said inherent action and a composed success of the node actions of said children nodes" and concludes that it is not clear what the Applicant is intending to claim. Also, the Examiner states that the above quoted language is interpreted as "successful implementation means occurrence of actions".

In the first place, the recitation "said parent node placing deontic modalities on the behavior of said child nodes...of said children nodes" is described in the Substitute Specification beginning in paragraph [0041] through paragraph [0054] of the Substitute Specification, under the Detailed Description of the Preferred Embodiment. It is submitted that the specification provides a clear description of the meaning of the language which the Examiner considers to be indefinite when the

claims are read in light of the specification from the perspective of a person of ordinary skill in the art considering the prior art cited in the specification. Moreover, it should be understood that the Substitute Specification discloses in paragraph [0021], that "[t]he present invention builds on concepts from the original work of Barbuceanu et al on OPI...to external events".

Moreover, the Examiner's stated interpretation of the recitation in claim 1 of "said parent node placing deontic modalities...of said children nodes" as meaning "successful implementation means occurrence of actions" is erroneous. The Examiner's interpretation is inconsistent with the clear meaning of the end of claim 1 which it is submitted is definite to a person of ordinary skill in the art having read Applicants' specification including the aforementioned parts.

Claims 1-10 and 12-29 stand rejected under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter. Specifically, the Examiner reasons as follows:

> **Claims 1-10, 12-29** constitute software modules devoid of any apparent hardware, and therefore are computer programs e.g., functional descriptive material. Since the computer programs are not embodied on an appropriate computer-readable storage medium, they cannot be afforded patent eligibility.
>
> Also, the claims fail to provide a tangible result, and that there must be a practical application, by
>
> 1) transforming (physical thing) or
>
> 2) having the FINAL RESULT (not the steps) achieve
> produce a useful (specific, substantial, AND credible),
> concrete (substantially repeatable! non-unpredictable), AND
> tangible (real world/ non-abstract) result.
>
> A claim that is so broad that it reads on both statutory and non-statutory subject matter must be amended. If the specification

> discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended. A claim that recites a computer that solely calculates a mathematical formula is not statutory.
>
> In instant case, **claims 1-10, 12-29** are drawn to a communication system for implementing personalizable and customizable features comprising a tuple space and a plurality of agents. The claims only mention about agent communications and agent structures, which is merely an abstract idea. There is no result outputted from the system that produces a concrete, useful and tangible result.

These grounds of rejection are traversed for the following reasons.

The Examiner correctly observes that claims 1-10 and 12-29 are drawn to a communication system for implementing personalizable and customizable features comprising a tuple space and a plurality of agents. Moreover, newly submitted claims 30-57 recite a system. See Fig. 1 and the description thereof beginning in paragraph [0021] of the Substitute Specification. Moreover, Figs. 4 and 5 illustrate respectively the claimed tree structure and feature cooperation between user agents. All of this disclosed subject matter, as recited in the claims, involves communications between user agents "communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obligated inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence for implementation of each feature". Contrary to the Examiner's assertion, communications posted to a tuple space between a plurality of user agents involving parent and child nodes with parent nodes placing deontic modalities on the behavior of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children

nodes are between software entities which are not abstractions. The claims recite a system comprised of communications software entities which is statutory subject matter.

The Examiner's conclusion that a claim that recites a computer that solely calculates a mathematical formula is not statutory has no relationship to the aforementioned claimed system. Moreover, the Examiner's conclusion that "[t]he claims only mention about user communications and agent structures which is merely an abstract idea" is not borne out by the reading of independent claims 1 and 10 and newly submitted claims 30 and 39 which, as discussed above, recite that the communication system and the system respectively have a tuple space and a plurality of user agents representing features with the user agents communicating with each other via assertions posted in the tuple space in order to implement said features which, it is submitted, is a concrete, useful and tangible result.

Moreover, the Examiner's conclusion that "[t]here is no result outputted from the system that produces concrete, useful and tangible result" is not a criteria necessary for statutory subject matter. There is no requirement that an output be produced when, in fact, numerous communications are recited between each of the software entities of the independent claims and dependent claims.

Claims 1-10 and 12-29 stand rejected under 35 U.S.C. §102 as being anticipated by Buhr et al Publication entitled, "Feature-Interaction Visualization and Resolution in an Agent Environment". These grounds of rejection are traversed for the following reasons.

See paragraphs [0016]-[0020] of the Substitute Specification, for a description of the prior art application of deontic methods pertaining to obligation,

permission, interdiction (OPI) systems. Moreover, the invention is stated to be built upon the prior art technique of Barbuceanu et al involving OPI in paragraph [0021] of the Substitute Specification. Moreover, as stated in paragraph [0021], "[h]owever, according to the present invention, new concepts are added and new semantics are set forth that completely change the basis of the prior art OPI concept which "[a]s a result, the prior art OPI has been modified from a planning system for a monolithic predetermined feature set to a set of semantics that are optimized for run-time execution of dynamically composed features that adapt to external events".

Moreover, in paragraphs [0024] and [0025] of the Substitute Specification, under the Summary of the Invention, it is stated as follows:

> As part of execution, each node monitors the success of its own operation. The deontic modalities give the system the ability to determine essential and optional operations in a feature specification. During execution this allows the system to negotiate feature behavior with the ability to determine if a particular feature has met its prime objective. This capacity is not present in existing feature specification systems such as Chisel, which lessens their ability to specify features taking into account required interactions. Tree node monitoring also greatly eases the design of systems for run time interaction detection and resolution by providing a feasible way of performing negotiations.
>
> Modalities are applied to each node. Some nodes specify interaction with other features (i.e. how the feature is to react to the actions of other features). If an action requested from another node is given the modality "obliged" and it cannot be performed, then the current feature is deemed to have failed and clean up measures are invoked. Similarly, if an interdicted observation occurs the feature is considered to have failed and clean up measures take place.

A person of ordinary skill in the art understands that the prior art OPI system of Barbuceanu et al pertains to the generation of prototypes for preplanning or off-line definition of features, but is not be applied to a practical run-time system.

The claimed features are recited as "structured as a set of deontic task trees". The term "deontic" is specific in meaning and relates to duties or obligations. Paragraph [0042] of the Substitute Specification describes deontic logic as the logic of obligation. A deontic task tree is a tree structure of duties or obligations. Buhr et al fails to teach or suggest this feature of applicant's claims. The Examiner's conclusion that "task tree and use case maps are non-functionally distinct" since "they both provide visual representation of structures" is unsupportable. A tree conforms to a very specific structure (as recited in the claims) of parent and child nodes. A UCM is a generic definition of scenarios at an abstract level, without the tree structure with parent and child nodes, as defined by the claims in the present application. UCMs as set forth in Buhr et al are not executable. They are used so that people can visualize and discuss systems. The third paragraph of Buhr et al indicates that tables "partially generated' from UCMs "provided that framework" for humans to add information to create executable prototypes.

Buhr et al do not teach the recitation in the claims of "placing deontic modalities on the behavior of at least one of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes" as recited in claims 1 and 30, and "placing permitted deontic modalities on the behavior of at least one of said child node so as to avoid spurious feature interactions" as recited in claims 10 and 39.

Buhr et al teach a visualization system for enabling humans to create executable prototypes so that user agents negotiate over a tuple space to implement features while avoiding feature interaction. As stated above, there is no disclosure

of a parent node placing deontic modalities on the behavior of at least one of said child nodes.

It is noted that the Examiner states on page 7 of the Office Action that the claimed recitation "said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of said feature results from successful occurrence of said inherent action and composed success of node actions of said children nodes (notifying caller agents success or not. See e.g., Fig. 7 especially the notify path)." It is submitted that this disclosure does not represent the claimed placing by a parent node of deontic modalities on the behavior of child nodes. It is submitted that there are no deontic modalities disclosed in Buhr et al. What the Examiner asserts to be modalities are merely indications of features that are acceptable or unacceptable by the receiving agent or the originating agent. There is no disclosure of deontic modalities obligated, permitted, interdicted or waved which are placed on the child nodes by the parent nodes.

Moreover, the following assertions of the Examiner are traversed.

(1) The claimed "parent node" and the "child node" are functionally equivalent to the stubs in the UCM presentation in Buhr et al with the Examiner concluding that a parent node is the same as the first stub along a path. A child in a UCM is a place holder to contain information that is too detailed for the level of abstraction that is being used on the current map. The stub (as a place holder) contains more detailed information. In the map shown in Fig. 7 of Buhr et al, the stubs are "dynamic" in the sense that they are used to show alternative behaviors that must fit into one section of the high level map. UCMs are not executable so that the comparison between the goal of a parent node (stubs don't have any) and the sub-goals of the child node is

technically not accurate. More importantly, the Examiner concludes that parent and child are stubs along the same path. Child node goals are "contained" within the overall goal of the parent and are sub-goals that must be achieved (in the OPI sense) in order for the parent to succeed. A more accurate characterization of using stubs is that stubs are maintained within stubs rather than stubs along the same path.

(2) The Examiner asserts that the claimed "placing deontic modalities on the behaviors of said child nodes such that successful implementation of said features results from successful occurrence of said inherent action and composed success of the node actions of said children nodes" is functionally equivalent to notifying the caller agent of success or not via the notify path of Fig. 7 of Buhr et al. The Examiner has ignored reference to "composed success of the node actions of said child nodes" as recited in the claims. The parent node evaluates the success of the children in terms of their deontic modalities (OPI) and the operator placed on their action (parallel, choice, sequence...). This is not the simple reporting which the Examiner has referenced in Fig. 7, but rather evaluation of terms of specifications. This evaluation is based on the way in which the success of the parent node is dependent on the success of its children. Moreover, the parent/child relationship is based on the dependency for goal success and hence the claim language of "composed success". The goal of dependency, as a general feature of all parent child relationships, is not represented by the success reporting that the Examiner identifies in Buhr et al.

(3) The Examiner argues that claims 2, 7, and 12 recite that the parent node "is provided with a sequence operator defining said predetermined sequence" which

is the functional equivalent of the "four plug-ins" shown in Fig. 7 of Buhr et al and, as stated in Section 3.2 "we intend to extend it with the OPI model...which allows us to structure goals in a hierarchy or alternative, parallel and sequential sub-goals." This assertion is traversed since the Examiner has ignored the reference to "intend" in the cited reference. It is submitted that Buhr et al is not enabling for this subject. Moreover, the reference to "intend" in Buhr et al is to extend the UCM requirement language. Deontic task trees are related to the UCM requirement specification. Moreover, the OPI model discussed in Buhr et al is to "Barbuceanu" since Barbuceanu is referenced to in the citations in Buhr et al. The OPI model of Barbuceanu is a planning and negotiation language which is not executable. It specifies constraints that allow for the negotiation of acceptable behavior (as an example, Fig. 11) in Section 4 of Barbuceanu. A caller may indicate that forwarding to certain numbers is not acceptable and therefore, is forbidden. The OPI of Barbuceanu and that recited regarding the deontic modalities are not functionally equivalent. The Barbuceanu OPI is a planning and negotiation specification language which is entirely different from the executable deontic task tree language. The claims are directed to an executable node specifying behavior while the Barbuceanu operator specifies only constraints that can be used to plan an operation.

(4) The Examiner argues that in claims 9 and 23-29 the recitation of assertions to the tuple space is anticipated by the disclosure "scope to name said assertions for subscription by a node" is met in the prior art by the comment field as shown in Table 1 (scope is merely a description of a feature, it is not functionally distinct from the comment field); "fact, to convey information about a user" is met in

the prior art by preconditions, as shown in Table 1, in Fig. 12; "task, to define a goal that sender action requires a receiver action to perform" is met in the prior art by the "goal" discussed, for example, in Table 1; and "Modulator" to place a constraint on the execution of the goal that a sender action has sent" is functionally indistinct from the "task field" discussed, for example, in Table 1, they both constrain what needs to be done to reach a goal. This assertion is traversed since the comment field in Buhr et al is simply that a comment field allows annotation for human understanding. The recited "scope" is translated for the deontic task trees to a functional part of the operation. The recited "scope" provides a limitation where assertions may be found, for example, assertions about "Alice" may be found in a "Alice Scope" and assertions about "Bob" may be found in a "Bob Scope". This allows assertions to be specified without constantly having the specifier considering their uniqueness. Thus, an assertion "busy" can be declared in the "Bob Scope" without concern that this might cause confusion in the operation of Alice's feature. It also has the benefit of improving search times if the deontic task trees are implemented of a tuple space or other content addressable memory. Only tuples within a specific scope need to be searched.

Newly submitted claims 30-57 recite subject matter which is not limited to communication systems. The comments set forth above with respect to the various rejections are equally applicable thereto.

In view of the foregoing amendments and remarks, it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (1375.42981X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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Attachments

DES:dlh